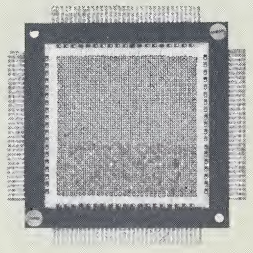
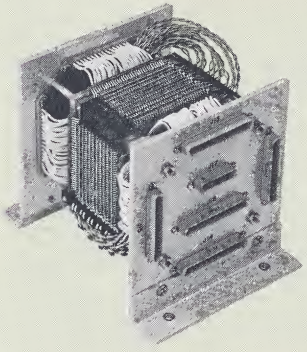
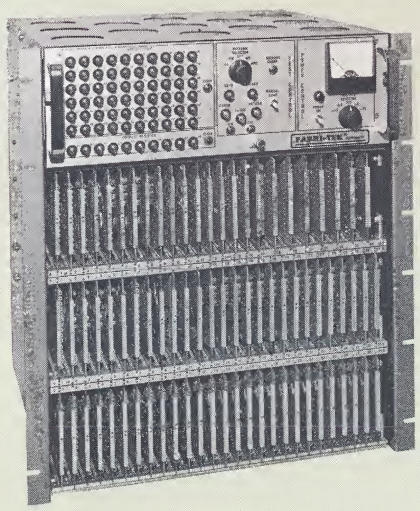
FABRI-TEK®

FABRI-TEK® designs and manufactures



MAGNETIC CORE MEMORY PLANES STACKS and SYSTEMS





In every complex data-processing system information is stored for use during the logical functions of the system. One of the most successful storage methods is the magnetic core memory. Digital information can be loaded into a magnetic core memory and retrieved in practically any sequence needed to match the electronic logic of the computing machinery. Capacities of magnetic core memories can be millions of information bits and speeds with which information can be fed in and taken out are in millionths and even billionths of a second. Fabri-Tek Incorporated is a leader in magnetic core memory technology and manufacture.

COMPANY GROWTH

Fabri-Tek was formally organized in 1957 to provide a specialized approach to the problems of core memory technology and fabrication. M. F. (Mike) Mickelson, president of Fabri-Tek, recognized at the beginning that memory design and manufacture required a different approach than normally found in large computer manufacturing organizations. A highly specialized engineering unit was required which was oriented to non-linear magnetics and materials, while still having a complete understanding of memory end usage. Special production skills had to be developed. A quality assurance program, which had no model in existing industry, had to be developed.

These elements of a successful magnetic memory firm produced amazing results. Fabri-Tek has grown, since 1957, to over 1,000 employees, two modern manufacturing facilities, a nationally-recognized research and development facility, and a customer list which includes some of the most successful companies in the data-processing industry.

M. F. (Mike) Mickelson

Fabri-Tek's centralized management and accounting offices are in the Foshay Tower, Minneapolis, Minnesota.

A modern, 50,000 square-foot plant in Amery, Wisconsin houses manufacturing and product engineering.

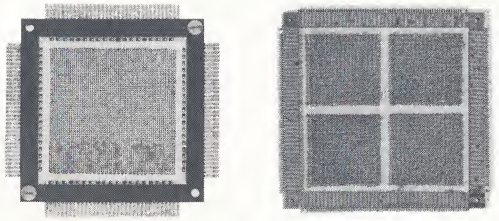
The manufacturing and product engineering facility at Eau Claire, Wisconsin has 25,000 square feet of floor space.

A complete research and advanced development facility is located in suburban Minneapolis. A new research facility in suburban Minneapolis is planned for construction in 1965.

SALES GROWTH

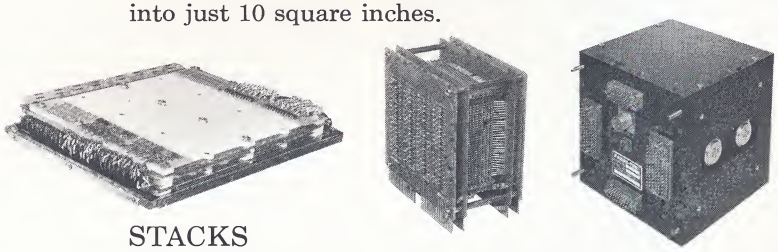
Fabri-Tek's sales have increased steadily, at a rate exceeding the growth of the data-processing industry . . . a proof that the industry has recognized the leadership of Fabri-Tek memory technology.

PRODUCT GROWTH



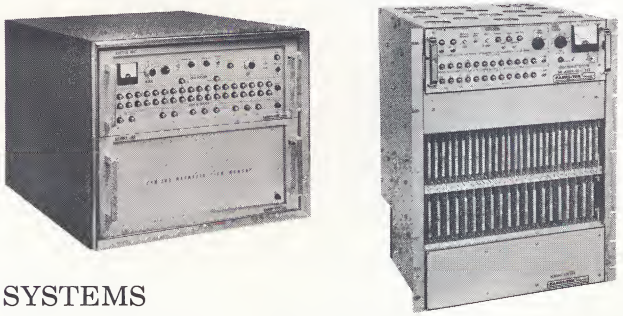
PLANES

Core memory planes with core sizes down to 20 mils in diameter and arranged in all types of computer access organization are the basic element of Fabri-Tek's products. Fabri-Tek also leads in the manufacture of thin-film memory planes. To meet the data processing industry's demands for higher speeds, smaller sizes, greater reliability, and competitive pricing, the Fabri-Tek HIPAC concept has been developed. HIPAC easily fits 4,096 cores into just 10 square inches.



STACKS

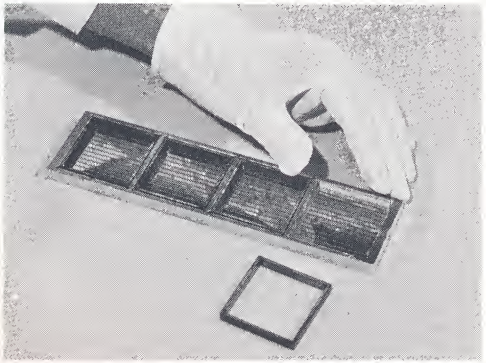
Planes stacked and wired to customer's specifications, with any number of bits and word capacities, are a major part of Fabri-Tek's business. Fabri-Tek's temperature-controlled stacks have solved memory performance problems for a great number of computer manufacturers. The HIPAC concept has provided customers with a miniature stack having the surprisingly low delay per bit of 10 picoseconds. A typical HIPAC stack with 4,096 words of 8 bits each takes up only 10 cubic inches.



SYSTEMS

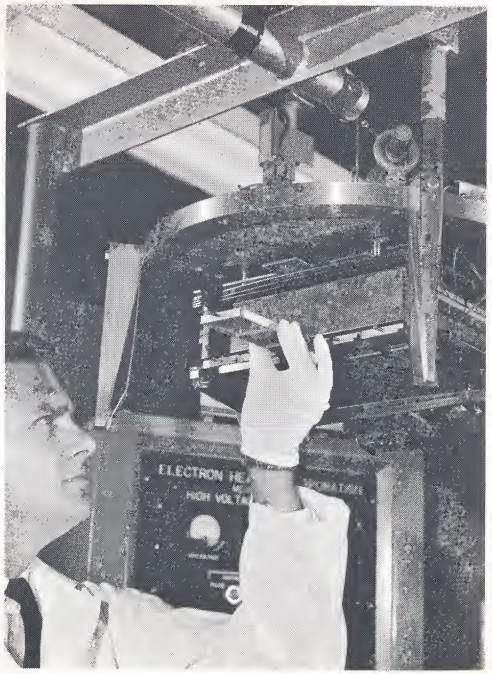
Many computer manufacturers have found it more economical to buy complete memory systems from Fabri-Tek. Systems from Fabri-Tek range from small buffers and auxiliary stores to complete computer memories of over a million bits. All Fabri-Tek systems are available with exclusive self-checking features and maintenance aids. Any speed from 20 microseconds to 300 nanoseconds and capacities of over 1 million bits can be provided, including the 1-microsecond Series MF coincident-current memory with all silicon semiconductors, and the 300-nanosecond FFM-202 thin film memory.

Substrate loading becomes simple and quick with this Fabri-Tek-designed equipment and technique.



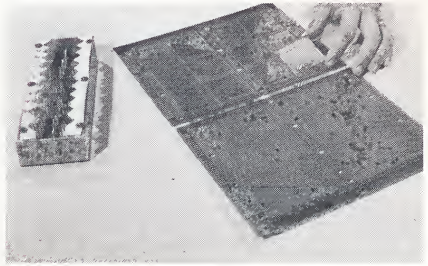
THE FIRST PRODUCTION

THIN FILM MEMORY SYSTEM



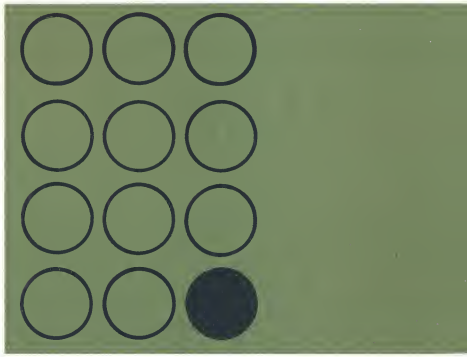
In keeping with Fabri-Tek's constant quest for memory technology leadership, the FFM-202 Thin-film Magnetic Memory System is the first production thin-film memory on the market.

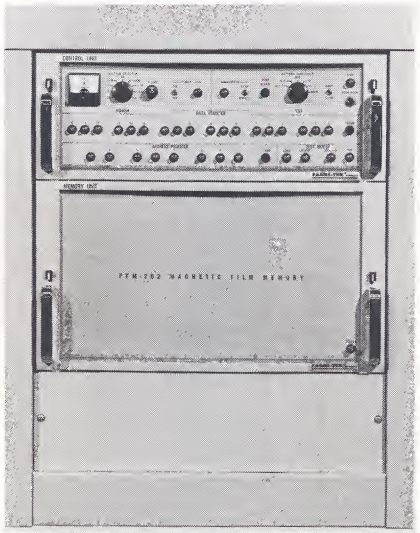
Its 300-nanosecond access time makes it ideal for scratchpad storage, index registers, and real-time data processing. Batch processing of permalloy-deposited memory substrates has been organized to provide a practically-priced, thin-film memory system.



Memory substrates are quickly assembled into thin-film planes with printed-circuit drive and sense lines.

Modern vacuum deposition equipment, modified to Fabri-Tek specifications, provides precision deposition with high-yield output.



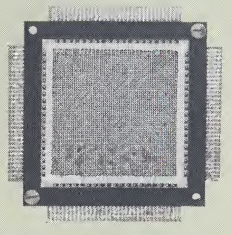


A Fabri-Tek thin-film memory stack wedded to reliable, high-speed circuitry makes the FFM-202 system the ultra-fast memory system needed for so many new real-time data processing problems.

THE HIPAC CONCEPT

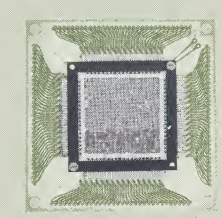
HOW HIPAC BEATS THE DELAY PER BIT PROBLEM

The high-speed ferrite cores now available, to be of practical value, must be operated with the shortest drive lines possible. Speed limitations are rapidly approaching the speed of light. Packaging treatment must take into consideration not only density, but practicality of wiring techniques.



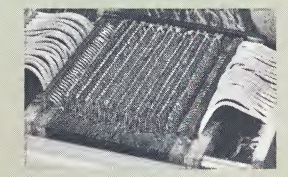
NO WINGS

Drive lines are shortened by a new concept of frame wiring which eliminates the flare-out of printed circuit wiring normally used to facilitate inter-plane connections. HIPAC uses a spring contact which can be solder-dipped. Drive lines are shortened and reliability is enhanced by the HIPAC concept.



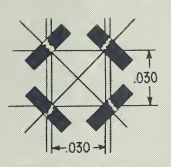
HIGH EFFICIENCY STACKING

Planes are simply stacked and solder-dipped to make inter-connections. A HIPAC stack can be assembled in a fraction of the time required before with riser interwiring techniques. Overall delay per bit plane for a HIPAC stack is only 10 picoseconds per bit.



COMPACT CORE SPACING

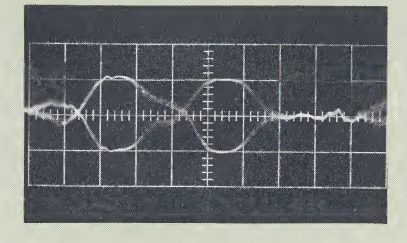
Fabri-Tek core-stringing techniques make it possible to space cores on centers equal to their diameter. Noise problems of closely-spaced cores are minimized by special drive line patterns.

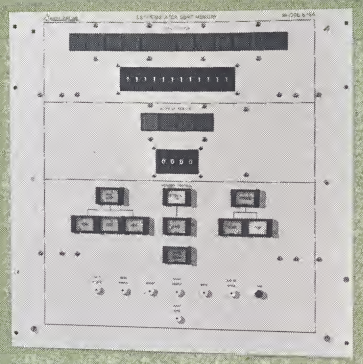


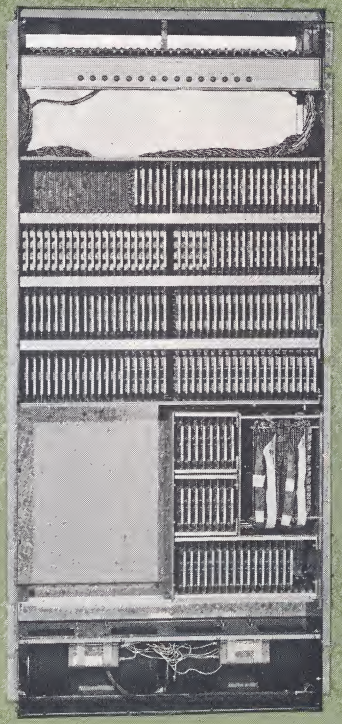
MODERATE DRIVE

HIGH OUTPUT

Normal HIPAC full-drive current for 20-mil o.d. cores is 700 milliamperes. Output is 25 millivolts. HIPAC stacks operate with wide operational margins for dependable reliability. This oscillograph shows all 1's being read and restored in a HIPAC stack installed in the Series MF one-microsecond coincident-current memory system. Scale is .1 microsecond per division.



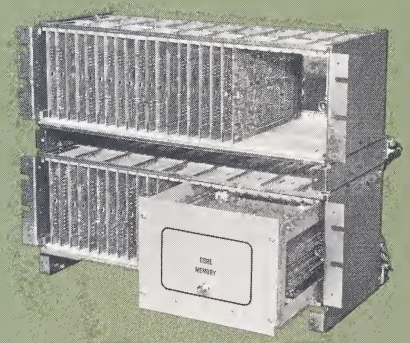




SYSTEMS CONCEPT

MATCHED EQUIPMENT

Fabri-Tek systems are not only designed to fit a customer's specifications electrically, but also fit the industrial design in appearance. Customer's colors, nameplates, and panel layout are matched to provide a unified appearance when the Fabri-Tek system is installed.

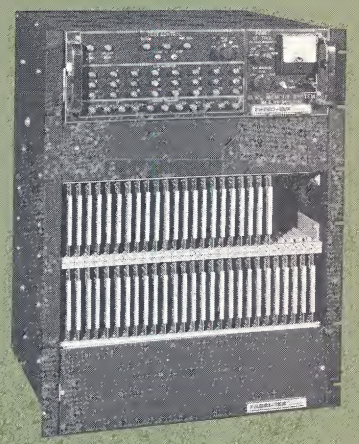


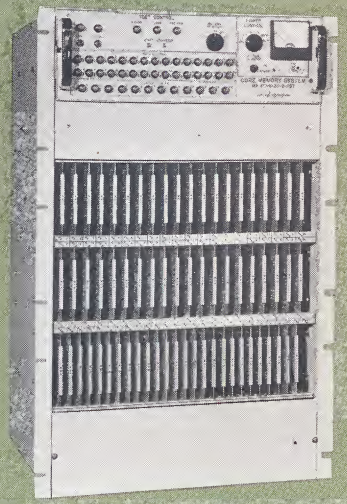
SELF-CONTAINED UNIT

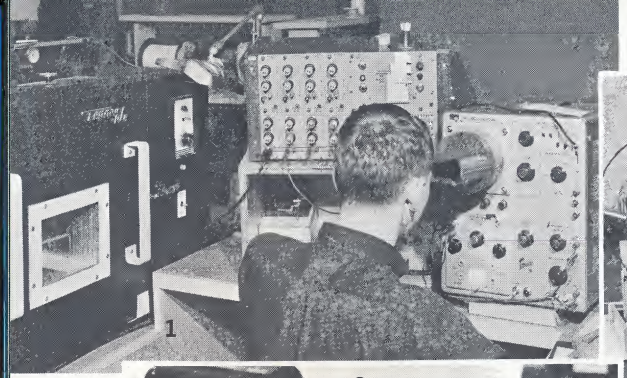
A Fabri-Tek system can have any degree of self-sufficiency. Typical systems contain complete memory circuits, regulated power supply, indicators, pattern generators, self-checking circuits, and Data Saver memory-holding circuits. The complete system is simply removed from the customer's equipment rack for servicing without complicated wiring connections.

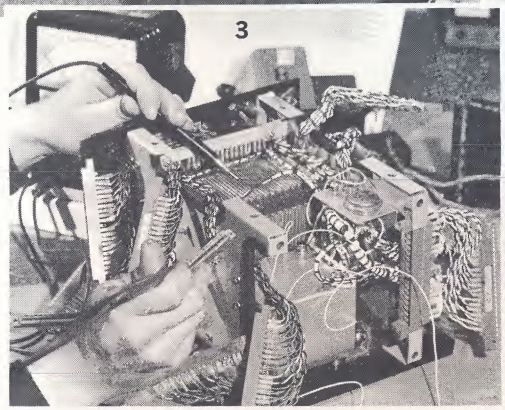
SELF-CHECKING UNIT

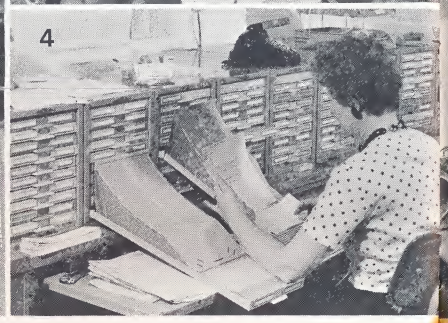
Fabri-Tek systems are available with self-exercisers and indicators. A quick glance is sufficient to tell a maintenance man that his troubles are not in the memory during trouble-shooting procedures. Power indication meters are calibrated in percentage to eliminate the need for calculation when checking sub-system power problems.

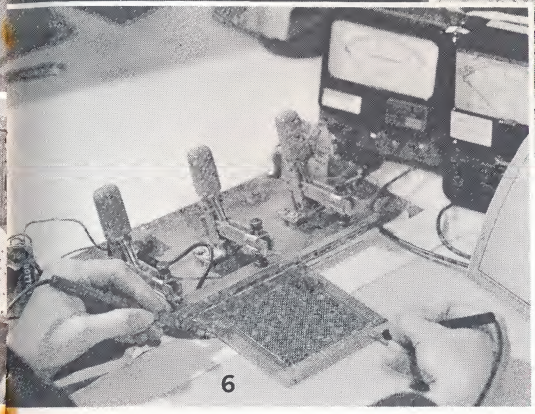


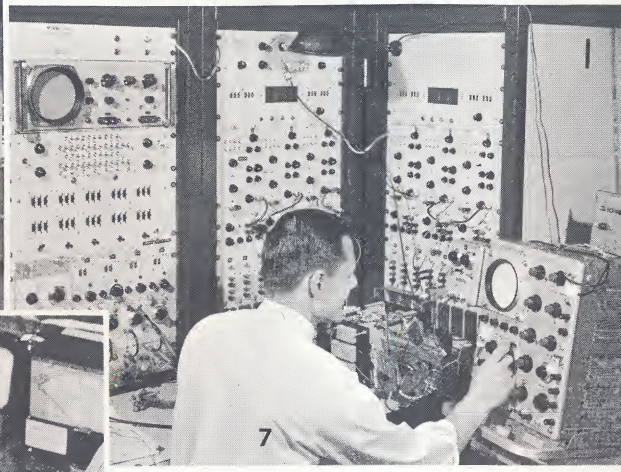




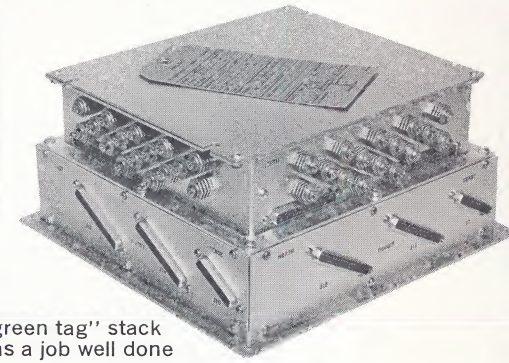






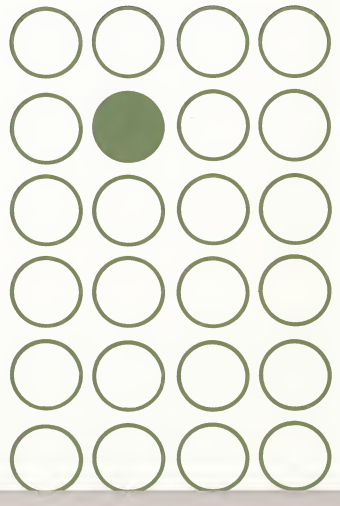


1. Testing incoming cores at controlled temperature. 2. 100% visual inspection of every core, wire, and soldered connection. 3. 100% electrical continuity inspection of wired stacks. 4. All inspection records from cores to finished product are permanently filed. 5. Environmental testing puts a core frame through temperature torture. 6. 100% continuity and resistance inspection. 7. 100% operational inspection.



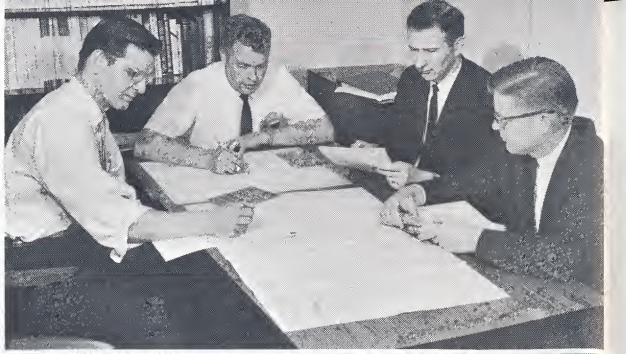
A "green tag" stack means a job well done

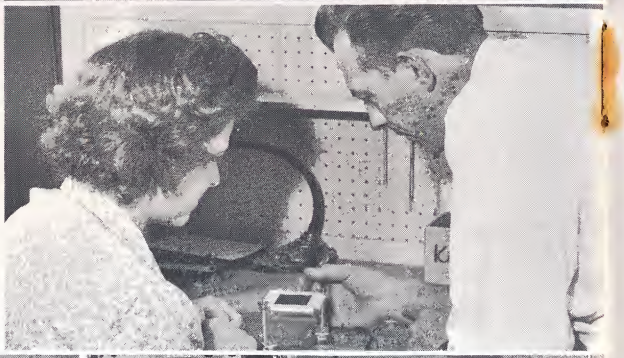
QUALITY ASSURANCE

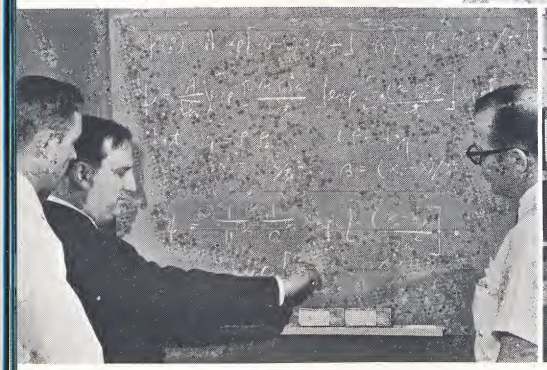


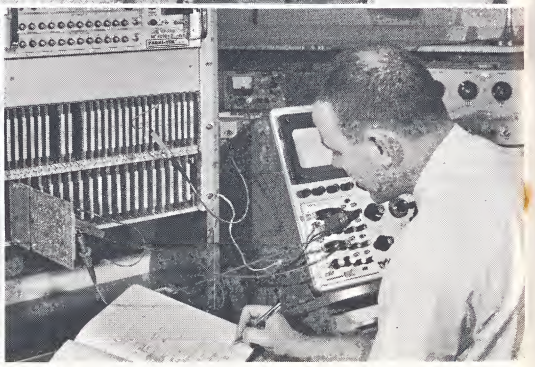
The Quality Assurance group at Fabri-Tek reports directly to top management. No product is shipped without approval of this group. Every core, every wire, and every soldered connection receives full inspection three times before the "green tag" approval is attached. A complete record of each memory plane is kept on permanent file, so that years from now, every aspect of manufacture can be reviewed if need be, right down to the individual core lot which went into original manufacture.

THE SOLUTIONS TO YOUR PROBLEMS ARE OUR BUSINESS









PRE-CONTRACT ENGINEERING

Every request for proposal receives the attention of expert memory system engineers who have spent their professional lives up to now in the business of magnetic memory design.

PRODUCT ENGINEERING

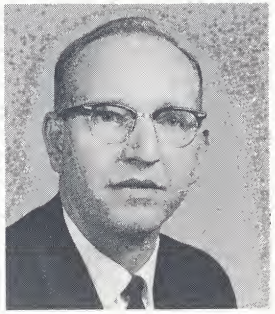
Once specifications have been agreed upon, product engineers go to work making it possible to manufacture to customer requirements with the greatest economies of time and money.

QUALITY ASSURANCE

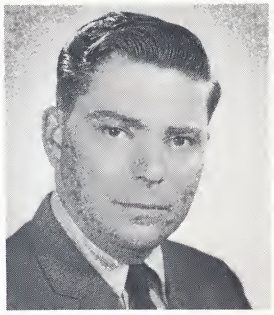
The watchmen of quality hover over every phase of manufacture. As irritating as a guilty conscience, nevertheless, they are appreciated by everyone at Fabri-Tek because the "green tag" of Quality Assurance approval means a job well done.

DEVELOPMENT LEADERSHIP

Behind every new product development is the Fabri-Tek Research and Advanced Development Center. The data processing industry's memory problems are anticipated here so that answers are ready before the questions are asked.



James W. Schallerer,
Vice President
Operations



Donald D. Haselhorst,
Vice President
Engineering

W. Del Clinton,
Vice President
Finance and
Treasurer

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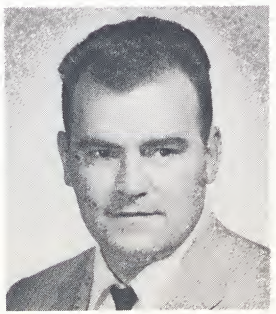
Dr. Peter L. Morawetz,
Director of Research

Richard J. Petschauer,
Director of Advanced
Product Development

Robert E. Rife,
Amery Plant Manager

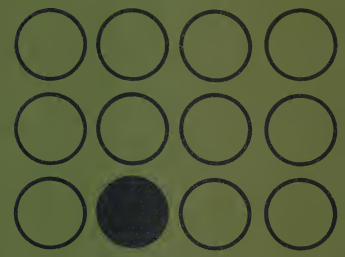


Clarence Enneking,
Eau Claire
Plant Manager

This little book gives you a brief look at Fabri-Tek. We'd like to talk with you and show you our facilities in person. If your work involves magnetic memory systems, we can help you. Please ask us!

Mike Mitchell

FABRI-TEK INCORPORATED
Foshay Tower, Minneapolis, Minnesota



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